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DATE: Wednesday, March 02, 2005

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<input type="checkbox"/>	L10	l6 and (guanine 37 or g37)	0
<input type="checkbox"/>	L9	l6 and (val13 or val389)	0
<input type="checkbox"/>	L8	l6 and (valine 13 or valine 389)	0
<input type="checkbox"/>	L7	L6 and dna fragment	26
<input type="checkbox"/>	L6	L5 and (fragment or portion)	213
<input type="checkbox"/>	L5	L4 and chlamydomonas	213
<input type="checkbox"/>	L4	L3 and transgenic	401
<input type="checkbox"/>	L3	L2 and plant	464
<input type="checkbox"/>	L2	L1 and herbicide	476
<input type="checkbox"/>	L1	ppo or protoporphyrinogen oxidase	5481

END OF SEARCH HISTORY

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NEWS	2		"Ask CAS" for self-help around the clock
NEWS	3	SEP 01	New pricing for the Save Answers for SciFinder Wizard within STN Express with Discover!
NEWS	4	OCT 28	KOREAPAT now available on STN
NEWS	5	NOV 30	PHAR reloaded with additional data
NEWS	6	DEC 01	LISA now available on STN
NEWS	7	DEC 09	12 databases to be removed from STN on December 31, 2004
NEWS	8	DEC 15	MEDLINE update schedule for December 2004
NEWS	9	DEC 17	ELCOM reloaded; updating to resume; current-awareness alerts (SDIs) affected
NEWS	10	DEC 17	COMPUAB reloaded; updating to resume; current-awareness alerts (SDIs) affected
NEWS	11	DEC 17	SOLIDSTATE reloaded; updating to resume; current-awareness alerts (SDIs) affected
NEWS	12	DEC 17	CERAB reloaded; updating to resume; current-awareness alerts (SDIs) affected
NEWS	13	DEC 17	THREE NEW FIELDS ADDED TO IFIPAT/IFIUDB/IFICDB
NEWS	14	DEC 30	EPFULL: New patent full text database to be available on STN
NEWS	15	DEC 30	CAPLUS - PATENT COVERAGE EXPANDED
NEWS	16	JAN 03	No connect-hour charges in EPFULL during January and February 2005
NEWS	17	FEB 25	CA/CAPLUS - Russian Agency for Patents and Trademarks (ROSPATENT) added to list of core patent offices covered
NEWS	18	FEB 10	STN Patent Forums to be held in March 2005
NEWS	19	FEB 16	STN User Update to be held in conjunction with the 229th ACS National Meeting on March 13, 2005
NEWS	20	FEB 28	PATDPAFULL - New display fields provide for legal status data from INPADOC
NEWS	21	FEB 28	BABS - Current-awareness alerts (SDIs) available
NEWS	22	FEB 28	MEDLINE/LMEDLINE reloaded
NEWS	23	MAR 02	GBFULL: New full-text patent database on STN
NEWS EXPRESS			JANUARY 10 CURRENT WINDOWS VERSION IS V7.01a, CURRENT MACINTOSH VERSION IS V6.0c(ENG) AND V6.0Jc(JP), AND CURRENT DISCOVER FILE IS DATED 10 JANUARY 2005
NEWS HOURS			STN Operating Hours Plus Help Desk Availability
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FILE 'HOME' ENTERED AT 16:21:24 ON 02 MAR 2005

=> file agricola caplus biosis

COST IN U.S. DOLLARS

SINCE FILE

TOTAL

ENTRY

SESSION

FULL ESTIMATED COST

0.21

0.21

FILE 'AGRICOLA' ENTERED AT 16:21:32 ON 02 MAR 2005

FILE 'CAPLUS' ENTERED AT 16:21:32 ON 02 MAR 2005

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FILE 'BIOSIS' ENTERED AT 16:21:32 ON 02 MAR 2005

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=> s ppo or protoporphyrinogen

L1 6468 PPO OR PROTOPORPHYRINOGEN

=> s l1 and plant?

L2 1757 L1 AND PLANT?

=> s l2 and herbicide

L3 390 L2 AND HERBICIDE

=> s l3 and oxidase

L4 366 L3 AND OXIDASE

=> s l4 and chlamydomonas

L5 14 L4 AND CHLAMYDOMONAS

=> dup rem l5

PROCESSING COMPLETED FOR L5

L6 11 DUP REM L5 (3 DUPLICATES REMOVED)

=> d 1-11 ti

L6 ANSWER 1 OF 11 CAPLUS COPYRIGHT 2005 ACS on STN

TI Methods and vectors for **plant** and algae plastid transformation using dual selection phases

L6 ANSWER 2 OF 11 CAPLUS COPYRIGHT 2005 ACS on STN

TI **Herbicide-resistant transgenic plants** having **protoporphyrinogen IX oxidase** inhibitor binding activity, and use in weed control

L6 ANSWER 3 OF 11 CAPLUS COPYRIGHT 2005 ACS on STN

TI A method for evaluating the ability of a compound to inhibit the **protoporphyrinogen oxidase** activity

L6 ANSWER 4 OF 11 CAPLUS COPYRIGHT 2005 ACS on STN

TI Transgenic **plants** tolerant of herbicidal inhibitors of porphyrin biosynthesis

L6 ANSWER 5 OF 11 CAPLUS COPYRIGHT 2005 ACS on STN

TI Methods of conferring resistance to herbicides inhibiting **protoporphyrinogen** biosynthesis to crop **plants**

L6 ANSWER 6 OF 11 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2005) on STN DUPLICATE 1

TI Isolation and characterization of a mutant **protoporphyrinogen oxidase** gene from **Chlamydomonas reinhardtii** conferring resistance to porphyrin herbicides.

L6 ANSWER 7 OF 11 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2005) on STN DUPLICATE 2

TI Characterization of a mutant of **Chlamydomonas reinhardtii** resistant to **protoporphyrinogen oxidase** inhibitors.

L6 ANSWER 8 OF 11 CAPLUS COPYRIGHT 2005 ACS on STN

TI Isolation and characterization of a **Chlamydomonas reinhardtii** mutant resistant to photobleaching herbicides

L6 ANSWER 9 OF 11 BIOSIS COPYRIGHT (c) 2005 The Thomson Corporation on STN

TI Mode of action studies on a chiral diphenyl ether peroxidizing herbicide: Correlation between differential inhibition of **protoporphyrinogen IX oxidase** activity and induction of tetrapyrrole accumulation by the enantiomers.

L6 ANSWER 10 OF 11 BIOSIS COPYRIGHT (c) 2005 The Thomson Corporation on STN

TI Isolation and characterization of a **Chlamydomonas reinhardtii** mutant resistant to an experimental herbicide S-23142, which inhibits chlorophyll synthesis.

L6 ANSWER 11 OF 11 CAPLUS COPYRIGHT 2005 ACS on STN

TI Treatment of polycythemia vera or hyperbilirubinemia with inhibitors of **protoporphyrinogen** conversion to heme

=> d ab

L6 ANSWER 1 OF 11 CAPLUS COPYRIGHT 2005 ACS on STN

AB The invention relates to methods and vectors for **plant** and **algae** plastid transformation. The method includes two phases of selection with first selection phase using a non-lethal compound and a second selection phase using a lethal compound

=> d pi

L6 ANSWER 1 OF 11 CAPLUS COPYRIGHT 2005 ACS on STN

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004035734	A2	20040429	WO 2003-US31941	20031007
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
US 2004133937	A1	20040708	US 2003-680824	20031007

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=> s l4 and transgenic
L7          54 L4 AND TRANSGENIC

=> dup rem l7
PROCESSING COMPLETED FOR L7
L8          44 DUP REM L7 (10 DUPLICATES REMOVED)

=> s l8 and valine
L9          2 L8 AND VALINE

=> d 1-2 ti

L9  ANSWER 1 OF 2  CAPLUS  COPYRIGHT 2005 ACS on STN
TI  Plant genes for protoporphyrinogen oxidases and the
    development of herbicide-resistant forms of the enzyme

L9  ANSWER 2 OF 2  CAPLUS  COPYRIGHT 2005 ACS on STN
TI  Genes encoding herbicide inhibitor-resistant mutants of
    plant protoporphyrinogen oxidase and
    transgenic plants expressing same

=> s l4 and (390 or 365 or 389)
L10         4 L4 AND (390 OR 365 OR 389)

=> dup rem l10
PROCESSING COMPLETED FOR L10
L11         2 DUP REM L10 (2 DUPLICATES REMOVED)

=> d 1-2 ti

L11 ANSWER 1 OF 2  CAPLUS  COPYRIGHT 2005 ACS on STN
TI  Genes encoding herbicide inhibitor-resistant mutants of
    plant protoporphyrinogen oxidase and
    transgenic plants expressing same

L11 ANSWER 2 OF 2  AGRICOLA  Compiled and distributed by the National
    Agricultural Library of the Department of Agriculture of the United States
    of America. It contains copyrighted materials. All rights reserved.
    (2005) on STN                                     DUPLICATE 1
TI  Isolation and characterization of a mutant protoporphyrinogen
    oxidase gene from Chlamydomonas reinhardtii conferring resistance
    to porphyric herbicides.

=> s ((boynton, j?) or (boynton j?))/au
L12         362 ((BOYNTON, J?) OR (BOYNTON J?))/AU

=> s l12 and protoporphyrinogen
L13         10 L12 AND PROTOPORPHYRINOGEN

=> dup rem l13
PROCESSING COMPLETED FOR L13
L14         5 DUP REM L13 (5 DUPLICATES REMOVED)

=> d 1-5 ti

L14 ANSWER 1 OF 5  CAPLUS  COPYRIGHT 2005 ACS on STN
TI  Methods of conferring resistance to herbicides inhibiting
    protoporphyrinogen biosynthesis to crop plants

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    Agricultural Library of the Department of Agriculture of the United States

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of America. It contains copyrighted materials. All rights reserved.
(2005) on STN DUPLICATE 1

TI Isolation and characterization of a mutant **protoporphyrinogen** oxidase gene from *Chlamydomonas reinhardtii* conferring resistance to porphyric herbicides.

L14 ANSWER 3 OF 5 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved.
(2005) on STN DUPLICATE 2

TI Characterization of a mutant of *Chlamydomonas reinhardtii* resistant to **protoporphyrinogen** oxidase inhibitors.

L14 ANSWER 4 OF 5 CAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 3

TI Isolation and characterization of a *Chlamydomonas reinhardtii* mutant resistant to photobleaching herbicides

L14 ANSWER 5 OF 5 CAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 4

TI Isolation and characterization of a *Chlamydomonas reinhardtii* mutant resistant to an experimental herbicide S-23142, which inhibits chlorophyll synthesis

=> d 1 ab

L14 ANSWER 1 OF 5 CAPLUS COPYRIGHT 2005 ACS on STN

AB Genes for herbicide-resistant variants of **protoporphyrinogen** oxidase are described for use in creating herbicide-resistant crop plants. Resistance to these herbicides should allow for simpler and more effective weed management, and increase the value of these herbicides for agricultural use. The *Chlamydomonas reinhardtii* gene for **protoporphyrinogen** oxidase is identified and herbicide-resistance alleles created. **Protoporphyrinogen** oxidase genes of *Chlamydomonas reinhardtii* and *Arabidopsis thaliana* were cloned by complementation of a hemG mutant of *Escherichia coli*. In addition, the present invention provides methods to evaluate the inhibitory effects of test compds. on **protoporphyrinogen** oxidase activity, as well as methods to identify **protoporphyrinogen** oxidase inhibitors among test compds. Preferred cloned DNA fragments encoding **protoporphyrinogen** oxidase enzymes resistant to porphyric herbicides are also described.

=> d pi

L14 ANSWER 1 OF 5 CAPLUS COPYRIGHT 2005 ACS on STN

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9829554	A1	19980709	WO 1996-US20415	19961227
	W: AU, CA, JP, US				
	RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	CA 2276053	AA	19980709	CA 1996-2276053	19961227
	AU 9714298	A1	19980731	AU 1997-14298	19961227
	AU 739948	B2	20011025		
	EP 1007703	A1	20000614	EP 1996-944519	19961227
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
	JP 2002528036	T2	20020827	JP 1998-529941	19961227

=> d 2 ab

L14 ANSWER 2 OF 5 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States

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(2005) on STN DUPLICATE 1

- AB In plant and algal cells, inhibition of the enzyme **protoporphyrinogen** oxidase (Protox) by the N-phenyl heterocyclic herbicide S-23142 causes massive protoporphyrin IX accumulation, resulting in membrane deterioration and cell lethality in the light. We have identified a 40.4 kb genomic fragment encoding S-23142 resistance by using transformation to screen an indexed cosmid library made from nuclear DNA of the dominant rs-3 mutant of *Chlamydomonas reinhardtii*. A 10.0 kb HindIII subclone (Hind 10) of this insert yields a high frequency of herbicide-resistant transformants, consistent with frequent non-homologous integration of the complete RS-3 gene. A 3.4 kb XhoI subfragment (Xho3.4) yields rare herbicide-resistant transformants, suggestive of homologous integration of a portion of the coding sequence containing the mutation. Molecular and genetic analysis of the transformants localized the rs-3 mutation conferring S-23142 resistance to the Xho3.4 fragment, which was found to contain five putative exons encoding a protein with identity to the C-terminus of the Arabidopsis Protox enzyme. A cDNA clone containing a 1698 bp ORF that encodes a 563 amino acid peptide with 51% and 53% identity to Arabidopsis and tobacco Protox I, respectively, was isolated from a wild-type *C. reinhardtii* library. Comparison of the wild-type cDNA sequence with the putative exon sequences present in the mutant Xho3.4 fragment revealed a G leads to A change at 291 in the first putative exon, resulting in a Val leads to Met substitution at a conserved position equivalent to Val-389 of the wild-type *C. reinhardtii* cDNA. A sequence comparison of genomic Hind10 fragments from *C. reinhardtii* rs-3 and its wild-type progenitor CC-407 showed this G leads to A change at the equivalent position (5751) within exon 10.

=> d 2 so

- L14 ANSWER 2 OF 5 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved.
(2005) on STN DUPLICATE 1
- SO Plant molecular biology, Nov 1998. Vol. 38, No. 5. p. 839-859
Publisher: Dordrecht : Kluwer Academic Publishers.
CODEN: PMBIDB; ISSN: 0167-4412

=> d 3 ab

- L14 ANSWER 3 OF 5 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved.
(2005) on STN DUPLICATE 2
- AB A nuclear mutant of *Chlamydomonas reinhardtii* (rs-3) is resistant to several herbicides which inhibit the enzyme **protoporphyrinogen** oxidase (Protox) in plants, including S-23142 [N-(4-chloro-2-fluoro-5-propargyloxy)-phenyl-3,4, 5,6-tetrahydrophthalimide], acifluorfenethyl, oxyfluorfen, and oxadiazon. Protox enzyme activity in Percoll-purified chloroplast thylakoids from rs-3 is less sensitive to S-23142 than that from wild type, indicating that the rs-3 mutation either directly or indirectly confers resistance on the enzyme. Genetic analysis of rs-3 showed that resistance results from a single dominant nuclear mutation that maps to linkage group IX, 13.7 and 12.3 map units from sr-1 and pf-16 respectively. Efforts to identify the resistance gene from a cosmic library of rs-3 nuclear DNA by transformation have yielded one S-23142 resistant isolate from the cell wall-less arginine-requiring strain CC-425 (arg-2, cw-15). Since no isolates resistant to S-23142 were seen in control experiments, this suggests that the resistant isolate is a transformant and that the rs-3 gene can be isolated by screening individual cosmic clones by transformation.

=> d 3 so

- L14 ANSWER 3 OF 5 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2005) on STN DUPLICATE 2
- SO ACS symposium series, 1994. No. 559. p. 91-104
Publisher: Washington, D.C. : American Chemical Society, 1974-
CODEN: ACSMC8; ISSN: 0097-6156

=> d 4 ab

- L14 ANSWER 4 OF 5 CAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 3
- AB A review with 21 refs. of the mode of action of N-phenylimide photobleaching herbicides in comparison with di-Ph ether herbicides. These N-phenylimide herbicides as well as di-Ph ether herbicides induce protoporphyrin IX accumulation and inhibit **protoporphyrinogen** oxidase activity at extremely low concns. in higher plants. The binding of a ¹⁴C-labeled N-phenylimide herbicide S-23121 [N-[4-chloro-2-fluoro-5-[(1-methyl-2-propynyl)oxy]phenyl]-3,4,5,6-tetrahydrophthalimide] to the solubilized plastid fractions of greening corn seedlings is competed by the di-Ph ether herbicide acifluorfen-Et, but not by diuron, an inhibitor of photosynthetic electron transport. These results indicate a similar mode of action for both N-phenylimide and di-Ph ether herbicides. In order to investigate the mechanism of photobleaching herbicides at the mol. level, a strain of *Chlamydomonas reinhardtii* RS-3 resistant to N-phenylimide S-23142 [N-(4-chloro-2-fluoro-5-propargyloxyphenyl)-3,4,5,6-tetrahydrophthalimide] was isolated by mutagenesis with N-methyl-N'-nitro-N-nitrosoguanidine. The 90% inhibition concentration of N-phenylimide S-23142 for growth of RS-3 was 100 times higher than that for wild type. Maximum accumulation of protoporphyrin IX was reached at 0.03 μ M of S-23142 for the wild type and 3 μ M for RS-3. RS-3 was resistant to oxadiazon, oxyfluorfen and acifluorfen-Et which had been shown to have the same mechanism of action as N-phenylimide herbicides, but not to paraquat, diuron or fluridone. Genetic anal. of RS-3 strain showed that the resistance results from a dominant mutation (rs-3) in the nuclear genome. The magnesium protoporphyrin IX synthesizing activity from 5-aminolevulinic acid in chloroplast fragments isolated from RS-3 was less sensitive to S-23142 than that from wild type (CC-407). **Protoporphyrinogen** oxidase activity in Percoll-purified chloroplasts from RS-3 was also less sensitive to S-23142 than that from wild type. Thus, the resistance of RS-3 is specific for photobleaching herbicides, and the mutation is related to **protoporphyrinogen** oxidase, the primary site of the photobleaching herbicide action.

=> d 4 so

- L14 ANSWER 4 OF 5 CAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 3
- SO Zeitschrift fuer Naturforschung, C: Journal of Biosciences (1993), 48(3-4), 339-44
CODEN: ZNCBDA; ISSN: 0341-0382

=> d 5 ab

- L14 ANSWER 5 OF 5 CAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 4
- AB A mutant of *Chlamydomonas reinhardtii* rs-3 was isolated from a wild type strain CC-407. The rs-3 mutant shows 100 fold resistance to an exptl. herbicide S-23142 [N-(4-chloro-2-fluoro-5-propargyloxy)-phenyl-3,4,5,6-tetrahydrophthalimide] which inhibits the **protoporphyrinogen**

oxidase (Proto-ox) in the chlorophyll synthesis pathway and induces massive accumulation of porphyrins in cells. Repeated backcrosses of rs-3 to wild type stocks CC-124 and CC-125 yielded tetrads which segregated two herbicide sensitive and two resistant products, indicating that resistance results from a mutation in the nuclear genome. Synthesis of protoporphyrin IX from **protoporphyrinogen** in isolated chloroplast fragments from rs-3 is significantly less inhibited by S-23142 than in CC-407, indicating that the rs-3 mutation affects Proto-ox. Anal. of rs-3 arg-2/+ arg-7 diploids shows that the rs-3 mutation is dominant at the levels of both cell viability and Proto-ox enzyme resistance.

=> d 5 so

L14 ANSWER 5 OF 5 CAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 4
SO Res. Photosynth., Proc. Int. Congr. Photosynth., 9th (1992), Volume 3, 567-70. Editor(s): Murata, Norio. Publisher: Kluwer, Dordrecht, Neth. CODEN: 59IZA5

=> s ((gillham n?) or (gillham, n?))/au
L15 311 ((GILLHAM N?) OR (GILLHAM, N?))/AU

=> s l15 and protoporphyrinogen
L16 10 L15 AND PROTOPORPHYRINOGEN

=> dup rem l16
PROCESSING COMPLETED FOR L16
L17 5 DUP REM L16 (5 DUPLICATES REMOVED)

=> d 1-5 ti

L17 ANSWER 1 OF 5 CAPLUS COPYRIGHT 2005 ACS on STN
TI Methods of conferring resistance to herbicides inhibiting **protoporphyrinogen** biosynthesis to crop plants

L17 ANSWER 2 OF 5 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2005) on STN DUPLICATE 1

TI Isolation and characterization of a mutant **protoporphyrinogen** oxidase gene from *Chlamydomonas reinhardtii* conferring resistance to porphyrin herbicides.

L17 ANSWER 3 OF 5 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2005) on STN DUPLICATE 2

TI Characterization of a mutant of *Chlamydomonas reinhardtii* resistant to **protoporphyrinogen** oxidase inhibitors.

L17 ANSWER 4 OF 5 CAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 3
TI Isolation and characterization of a *Chlamydomonas reinhardtii* mutant resistant to photobleaching herbicides

L17 ANSWER 5 OF 5 CAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 4
TI Isolation and characterization of a *Chlamydomonas reinhardtii* mutant resistant to an experimental herbicide S-23142, which inhibits chlorophyll synthesis

=> s ((randolph-anderson, b?) or (randolph-anderson b?))/au
L18 24 ((RANDOLPH-ANDERSON, B?) OR (RANDOLPH-ANDERSON B?))/AU

=> dup rem l18

PROCESSING COMPLETED FOR L18

L19 13 DUP REM L18 (11 DUPLICATES REMOVED)

=> d 1-13 ti

L19 ANSWER 1 OF 13 BIOSIS COPYRIGHT (c) 2005 The Thomson Corporation on STN
TI Evidence consistent with linkage to 15q of a non-chromosome 4 linked FSHD family.

L19 ANSWER 2 OF 13 CAPLUS COPYRIGHT 2005 ACS on STN
TI Methods of conferring resistance to herbicides inhibiting protoporphyrinogen biosynthesis to crop plants

L19 ANSWER 3 OF 13 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2005) on STN DUPLICATE 1
TI Isolation and characterization of a mutant protoporphyrinogen oxidase gene from Chlamydomonas reinhardtii conferring resistance to porphyric herbicides.

L19 ANSWER 4 OF 13 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2005) on STN DUPLICATE 2
TI The chloroplast gene encoding ribosomal protein S4 in Chlamydomonas reinhardtii spans an inverted repeat--unique sequence junction and can be mutated to suppress a streptomycin dependence mutation in ribosomal protein S12.

L19 ANSWER 5 OF 13 CAPLUS COPYRIGHT 2005 ACS on STN
TI Molecular genetics of chloroplast ribosomes in Chlamydomonas reinhardtii

L19 ANSWER 6 OF 13 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2005) on STN DUPLICATE 3
TI Further characterization of the respiratory deficient dum-1 mutation of Chlamydomonas reinhardtii and its use as a recipient for mitochondrial transformation.

L19 ANSWER 7 OF 13 BIOSIS COPYRIGHT (c) 2005 The Thomson Corporation on STN
TI Further characterization of the respiratory deficient dum-1 mutation of Chlamydomonas reinhardtii and its use as a recipient for mitochondrial transformation.

L19 ANSWER 8 OF 13 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2005) on STN
TI Molecular genetics of chloroplast ribosomes in Chlamydomonas.

L19 ANSWER 9 OF 13 BIOSIS COPYRIGHT (c) 2005 The Thomson Corporation on STN
TI ENGINEERING THE CHLAMYDOMONAS CHLOROPLAST GENOME.

L19 ANSWER 10 OF 13 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2005) on STN DUPLICATE 4
TI Transformation of chloroplast ribosomal RNA genes in Chlamydomonas: molecular and genetic characterization of integration events.

L19 ANSWER 11 OF 13 CAPLUS COPYRIGHT 2005 ACS on STN

TI Manipulating the chloroplast genome of Chlamydomonas. Molecular genetics and transformation

L19 ANSWER 12 OF 13 CAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 5

TI Electrophoretic and immunological comparisons of chloroplast and prokaryotic ribosomal proteins reveal that certain families of large subunit proteins are evolutionarily conserved

L19 ANSWER 13 OF 13 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2005) on STN DUPLICATE 6

TI Chloroplast transformation in Chlamydomonas with high velocity microprojectiles.

=> d 2 ab

L19 ANSWER 2 OF 13 CAPLUS COPYRIGHT 2005 ACS on STN

AB Genes for herbicide-resistant variants of protoporphyrinogen oxidase are described for use in creating herbicide-resistant crop plants. Resistance to these herbicides should allow for simpler and more effective weed management, and increase the value of these herbicides for agricultural use. The Chlamydomonas reinhardtii gene for protoporphyrinogen oxidase is identified and herbicide-resistance alleles created. Protoporphyrinogen oxidase genes of Chlamydomonas reinhardtii and Arabidopsis thaliana were cloned by complementation of a hemG mutant of Escherichia coli. In addition, the present invention provides methods to evaluate the inhibitory effects of test compds. on protoporphyrinogen oxidase activity, as well as methods to identify protoporphyrinogen oxidase inhibitors among test compds. Preferred cloned DNA fragments encoding protoporphyrinogen oxidase enzymes resistant to porphyrin herbicides are also described.

=> d 2 so

L19 ANSWER 2 OF 13 CAPLUS COPYRIGHT 2005 ACS on STN

SO PCT Int. Appl., 109 pp.
CODEN: PIXXD2

=> d 2 pi

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9829554	A1	19980709	WO 1996-US20415	19961227
	W: AU, CA, JP, US				
	RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	CA 2276053	AA	19980709	CA 1996-2276053	19961227
	AU 9714298	A1	19980731	AU 1997-14298	19961227
	AU 739948	B2	20011025		
	EP 1007703	A1	20000614	EP 1996-944519	19961227
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
	JP 2002528036	T2	20020827	JP 1998-529941	19961227

=> s ((ishige, f?) or (ishige f?))/au

L20 29 ((ISHIGE, F?) OR (ISHIGE F?))/AU

=> s l20 and protoporphyrinogen

L21 4 L20 AND PROTOPORPHYRINOGEN

```

=> dup rem l21
PROCESSING COMPLETED FOR L21
L22      2 DUP REM L21 (2 DUPLICATES REMOVED)

=> d 1-2 ti

L22 ANSWER 1 OF 2 CAPLUS COPYRIGHT 2005 ACS on STN
TI  Methods of conferring resistance to herbicides inhibiting
    protoporphyrinogen biosynthesis to crop plants

L22 ANSWER 2 OF 2 AGRICOLA Compiled and distributed by the National
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    (2005) on STN                                     DUPLICATE 1
TI  Isolation and characterization of a mutant protoporphyrinogen
    oxidase gene from Chlamydomonas reinhardtii conferring resistance to
    porphyric herbicides.

=> s ((sato, r?) or (sato r?))/au
L23      3007 ((SATO, R?) OR (SATO R?))/AU

=> s l23 and protoporphyrinogen
L24      11 L23 AND PROTOPORPHYRINOGEN

=> dup rem l24
PROCESSING COMPLETED FOR L24
L25      6 DUP REM L24 (5 DUPLICATES REMOVED)

=> d 1-6 ti

L25 ANSWER 1 OF 6 CAPLUS COPYRIGHT 2005 ACS on STN
TI  Flumioxazin as a new herbicide

L25 ANSWER 2 OF 6 CAPLUS COPYRIGHT 2005 ACS on STN
TI  Methods of conferring resistance to herbicides inhibiting
    protoporphyrinogen biosynthesis to crop plants

L25 ANSWER 3 OF 6 AGRICOLA Compiled and distributed by the National
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    of America. It contains copyrighted materials. All rights reserved.
    (2005) on STN                                     DUPLICATE 1
TI  Isolation and characterization of a mutant protoporphyrinogen
    oxidase gene from Chlamydomonas reinhardtii conferring resistance to
    porphyric herbicides.

L25 ANSWER 4 OF 6 AGRICOLA Compiled and distributed by the National
    Agricultural Library of the Department of Agriculture of the United States
    of America. It contains copyrighted materials. All rights reserved.
    (2005) on STN                                     DUPLICATE 2
TI  Characterization of a mutant of Chlamydomonas reinhardtii resistant to
    protoporphyrinogen oxidase inhibitors.

L25 ANSWER 5 OF 6 CAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 3
TI  Isolation of characterization of a Chlamydomonas reinhardtii mutant
    resistant to photobleaching herbicides

L25 ANSWER 6 OF 6 CAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 4
TI  Isolation and characterization of a Chlamydomonas reinhardtii mutant
    resistant to an experimental herbicide S-23142, which inhibits chlorophyll
    synthesis

=> d ab

```

L25 ANSWER 1 OF 6 CAPLUS COPYRIGHT 2005 ACS on STN

AB Flumioxazin was discovered and developed by Sumitomo Chemical Company. Flumioxazin is used as an herbicide to control a wide variety of weeds in crop field, such as soybeans, peanut and tree fruit field, and non-crop area. Flumioxazin inhibits **protoporphyrinogen** oxidase of chlorophyll biosynthesis pathway. Flumioxazin has very big margin of safety against environment and human health. Flumioxazin had already been launched in South America, France, China and Japan, and registered in the United States within 2001.

=> d so

L25 ANSWER 1 OF 6 CAPLUS COPYRIGHT 2005 ACS on STN

SO Sumitomo Kagaku (Osaka) (2001), (1), 14-25
CODEN: SKAADZ; ISSN: 0387-1312